

Schiff's test and Fehling's test (Item No.: P7172400)

Task and equipment

Information for teachers

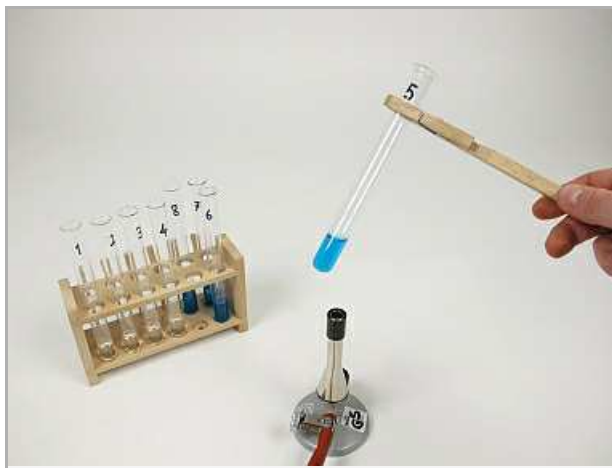
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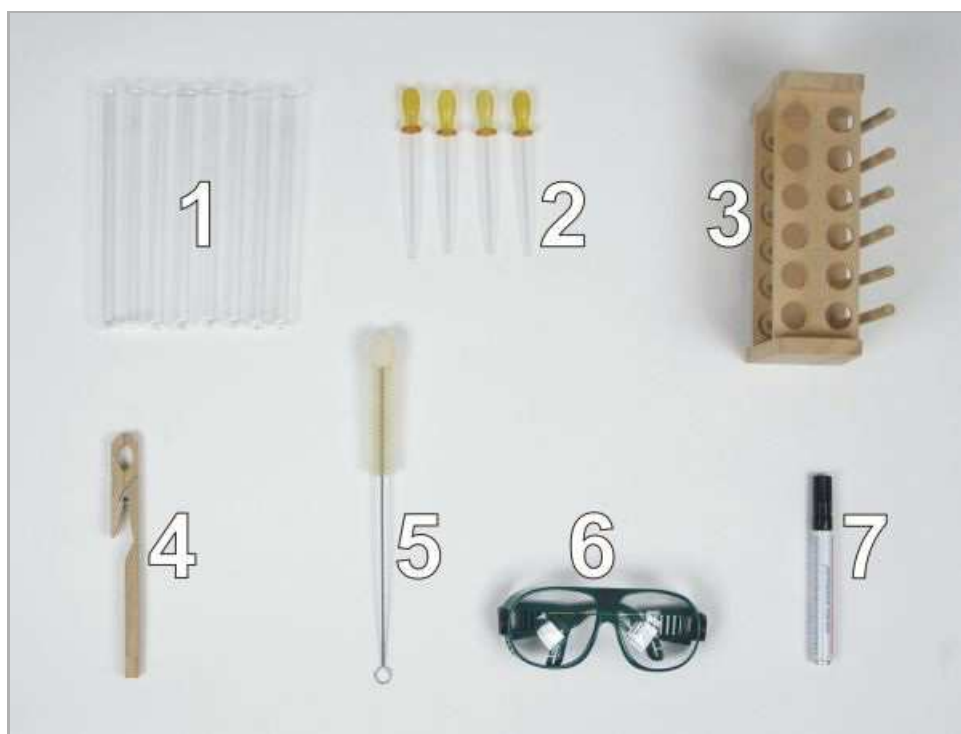
Task

How can aldehydes be distinguished from ketones?

Carry out the Schiff test and the test with Fehling's solution.



Equipment



Position No.	Material	Order No.	Quantity
1	Test tube, 180x18 mm, 100pcs	37658-10	(8)
2	Pipette with rubber bulb	64701-00	4
3	Test tube rack for 12 tubes, holes d= 22 mm, wood	37686-10	1
4	Test tube holder, up to d 22mm	38823-00	1
5	Test tube brush w. wool tip, d25mm	38762-00	1
6	Protecting glasses, clear glass	39316-00	1
7	Labor pencil, waterproof	38711-00	1
	Butane burner f. cartridge 270+470	47536-00	1
	Butane cartridge CV 300 Plus, 240 g	47538-01	1
	Acetaldehyde, 98-100% 250 ml	30001-25	1
	Acetone, gr 1 l	30004-70	1
	Fehling's solution I 250 ml	30079-25	1
	Fehling's solution II 250 ml	30080-25	1
	Schiff's reagent 250 ml	31827-25	1
Additional material			
	Oxidation product of 1-propanol from the experiment "Oxidation of alcohols" (P7172300)		
	Oxidation product of 2-propanol from the experiment "Oxidation of alcohols" (P7172300)		

Set-up and procedure

Set-up

Hazards

- Acetaldehyde and acetone are highly inflammable. Extinguish all open flames when handling them! Wear protective glasses!
- Remove all stock bottles before igniting the Bunsen burner. Position the Bunsen burner sufficiently well away from the test tubes!
- Acetaldehyde is harmful to health. Do not inhale it!
- Carry out the experiment in the fume hood!



Setup

Number the test tubes from 1 to 8.

Fill Schiff's reagent into test tubes 1 to 4 up to a height of about 2 cm. Fill Fehling's solution I into test tubes 5 to 8 up to a height of about 1 cm, add about the same amount of Fehling's solution II until a deep blue solution is formed (Fig. 1).



Fig. 1

Procedure

Pipette one drop of acetaldehyde into test tube 1 and two drops of acetaldehyde into test tube 5.

Change the pipette and put one drop of acetone into test tube 2 and two drops of acetone into test tube 6 (Fig. 2).

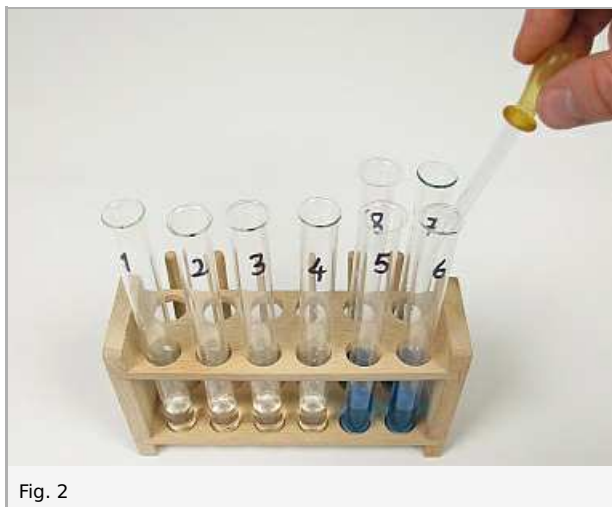


Fig. 2

Use the third pipette to put two drops of the solution containing the oxidation product of 1-propanol (will be supplied by the teacher) into test tube 3 and five drops of it in test tube 7.

Use the last pipette to put two drops of the solution containing the oxidation product of 2-propanol (will be supplied by the teacher) into test tube 4 and five drops of it in test tube 8.

Briefly heat the test tubes 5 to 8 in the flame of the Bunsen burner, one after the other. Shake them a little while doing this, but without causing the liquids to splash out.
Do not heat to boiling!



Fig. 3

Waste disposal

Leave the test tubes in the test tube rack for disposal.

Report: Schiff's test and Fehling's test

Result - Observations

Note your observations.

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Result - Table 1

Summarize your observations in the table.

	Schiff's test		Fehling's test	
Acetaldehyde (ethanal)	positive (violet colour)	1	positive (yellowish-red precipitate)	1
Acetone (propanone)	negative	1	negative	1
Oxidation product of 1-propanol	positive (violet colour)	1	positive (yellowish-red precipitate)	1
Oxidation product of 2-propanol	negative	1	negative	1

Evaluation - Question 1

Draw conclusions from your observations.

Evaluation - Question 2

Formulate a mnemonic sentence which allows to differentiate between aldehydes and ketones.

Evaluation - Question 3

Which property of the aldehydes is the basis for discriminating them from ketones?

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